

where the excess in rainfall was moderate, the State averages ranged from 6.79 inches for South Carolina, departure +2.94 inches, to 10.34 inches for the Mississippi area, departure +4.30 inches. The average for the entire district was 7.52 inches, which is 3.02 inches above the normal. The regions of greatest monthly rainfall were in southeastern Mississippi, central and northern Alabama, northeastern Georgia, and the adjoining portions of South Carolina, embracing the upper drainage areas of the Savannah, the Chattahoochee, the Alabama, and the Tombigbee Rivers. In the Mississippi area 16 places received over 10 inches, in Alabama 25 stations, and in Georgia 15. The rainfall was least near the coast and in Florida, where, in the southern portion, the amount received was less than 2 inches at several places. The maximum for the district was 14.56 inches at Laurel, Miss., followed by 14.22 inches at Porterville, Miss., and the least was 1.22 inches at Observation Island, Fla.

After a day or two of fair weather at the beginning of the month a long period of rainy weather occurred, lasting from the 3d to 16th, with snow and sleet from the 3d to 6th in Virginia and North Carolina, and very heavy local downpours of rain at a large number of stations throughout the district on the 5th-6th, 11th-12th, and 14th-15th. The heavy rains of the 14th-15th were especially noteworthy, 5 inches or more in 24 hours occurring at 15 stations, with the following maximum records: Salisbury, N. C., 6.23 inches; Santuc, S. C., 6.08; Elberton, Ga., 6.32; and Point Peter, Ga., 6.25. The following excessive amounts in brief intervals of time were registered: Pensacola, 3.30 inches in 1 hour 10 minutes, Atlanta 3.36 inches in 1 hour 37 minutes. Immediately after these storms a period of fine weather prevailed from the 17th to 21st, but general rains again fell from the 22d to 25th, and 28th to 30th, with excessive amounts on the 28th and 29th, especially in Georgia and Alabama.

The snowfall was heavy in Virginia and North Carolina, the State averages being respectively 10 and 5 inches, unmelted. The total fall exceeded 10 inches at 13 stations in Virginia and at 14 in North Carolina, with a maximum fall of 16 inches at Marion, N. C., of which 10 inches fell in 24 hours on the 5th-6th. This was the heaviest snowfall for March in the climatic history of North Carolina.

MISCELLANEOUS PHENOMENA.

The prevailing winds were from the northeast in all of the States bordering the Atlantic Ocean, from the north in Alabama and from the southeast in Mississippi. The wind movement was high even for March, the average hourly velocity exceeding 10 miles at Norfolk, Hatteras, Charleston, Atlanta, Savannah, Miami, and Pensacola; and there were many days with maximum velocities exceeding 40 miles an hour. The highest velocities were: Hatteras, 60 miles from the west on the 25th; Columbia, 57 miles southwest on the 15th; Savannah, 50 miles southeast on the 12th; and Pensacola, 62 miles northwest on the 11th, and 50 miles south on the 14th. The number of clear days ranged from 8 in Mississippi to 15 in Florida, the number of cloudy days from 7 in Florida to 17 in Mississippi; the average number of rainy days was 11.

SEVERE LOCAL STORMS.

The following brief descriptions of local storms have been furnished by the officials in charge of the stations named:

Pensacola, Fla.—(W. F. Reed, jr.)—A severe thunderstorm passed over Pensacola on the evening of March 11, 1912, traversing the city from northwest to southeast and causing much damage to buildings, fences, signs, roads, timber in booms, etc. Lightning began in the

northwest at 8 p. m.; the wind increased from 24 miles an hour from the southeast at 8.51 p. m. to 48 miles at 9 p. m.; south winds then prevailed until 9.14 p. m., when a sudden shift to northwest took place, the velocity increasing to 62 miles an hour, with a momentary gust at the rate of 100 miles an hour. The total damage is estimated at about \$5,000. Considerable property was saved by the warnings issued by the Weather Bureau.

Alabama (P. H. Smyth).—About 3 o'clock in the morning of March 15, 1912, a tornado developed about 2 miles northwest of Hartford, Geneva County, Ala., and moved northeastward into Henry County. The tornado passed over Wicksburg, Houston County, about 3 a. m., Jellico, Houston County, between 3 and 3.15 a. m., and Headland, Henry County, about 3.30 a. m.; it then seemed to have swerved to the right, passing south of Columbia, which is about 15 miles south by east of Headland, at 3.40 a. m. At Columbia it passed by the Central of Georgia Railroad depot, destroying the flues, and then moved across the Chattahoochee River into Georgia. Its path of greatest destruction varied in width from 100 to 400 yards. The trees on the north side and in the center of the path lie in all directions, while on the south side they were generally lying toward the northeast. The funnel-shaped cloud was seen by many persons. About 50 persons were more or less injured and 9 people were killed.

Much property was destroyed along the path of the storm. At Headland, where the greatest loss of life and property occurred, there were 5 deaths resulting from the storm, and about 26 persons injured; 32 buildings were demolished, at least half of these being totally destroyed; some live stock was killed. The total damage to property is estimated at nearly \$50,000.

Similar less destructive storms occurred at Farmville, Va., Cheraw, S. C., near Americus, Ga., and at many other places.

THE BREMO BLUFF TORNADO OF FEBRUARY 21, 1912.

By JAMES H. KIMBALL, Observer.

Tornadoes are of rare occurrence in Virginia, and a careful search through newspaper files and other records for a hundred years reveals but two storms that were unquestionably of that character. The local disturbance that crossed the James River just west of Brema Bluff, a small village about 50 miles west of Richmond, Va., shortly after 8 p. m. on February 21, 1912, seems to have been a true tornado, as several observers state that the characteristic pendent-shaped tornado cloud was present. The evening weather map of February 21 showed the presence of a marked area of low barometer over northern Virginia with a pressure of 29 inches, and the storm evidently formed close to the trough of the main depression.

Mr. Plummer F. Jones, cooperative observer at Arvonnia, states that the storm originated about a mile southwest of New Canton, Buckingham County, moved due north across the James River, then curved toward the northeast and crossed the Brema-Fork Union road about a mile and a half north of Brema, where it was dissipated. The path of the storm was at first about one-quarter of a mile wide, but soon narrowed to about 200 yards. Within its path hundreds of trees, some of them from 2 to 3 feet in diameter, were blown down, some falling southwest to northeast, others southeast to northwest; in one portion of the path the uprooted trees fell in all directions, indicating the tremendous rotary force of the wind. The country is hilly and well wooded, and everything in the path of the storm was prostrated. A few persons sustained slight injuries.

THE FLOODS OF MARCH, 1912, IN THE SOUTH ATLANTIC AND EAST GULF STATES.

By C. F. VON HERMANN, District Editor.

During March, 1912, destructive floods occurred in nearly all of the larger rivers that drain the eastern and southern slopes of the Appalachian Mountain system. Frequent rains during the early part of the month, accompanying the rapid succession of areas of low atmospheric pressure that moved from southwest to northeast over the district or near its northern borders,